Claims

What is claimed is:

1. A method for providing metering from a gateway in a packet network comprising:
   a) receiving a message comprising a complete call tariff model for controlling all metering in association with a call; and
   b) providing pulses to a metering entity during the call according to the call tariff model.

2. The method of claim 1 wherein the call tariff model defines a plurality of phases for the call, such that each phase is associated with a different tariff rate.

3. The method of claim 2 wherein each phase is associated with tariff parameters and a phase duration.

4. The method of claim 1 wherein the call tariff model defines a number of one-time charge pulses to provide during the call for a one-time charge.

5. The method of claim 4 wherein the one-time charge is a set-up charge.

6. The method of claim 4 wherein the one-time charge is an add-on charge.

7. The method of claim 4 wherein providing the pulses comprises providing the one-time charge pulses; providing recovery pulses to compensate for normal tariff pulses that should have been provided when the one-time charge pulses are provided; and providing normal tariff pulses after the one-time charge pulses and the recovery pulses are provided.

8. The method of claim 4 wherein the call tariff model divides a phase of the call into a plurality of pulse windows, such that a first pulse window defines the number of pulses for the one-time charge and normal tariff pulses for a first portion of the phase, and a second pulse window defines the normal tariff pulses for a second portion of the phase.

9. The method of claim 8 wherein the call includes other pulse windows, which correspond to other phases.

10. The method of claim 1 wherein the call tariff model defines a fractional pulse rate to implement over a given period, which is divided into n sub-periods, by providing a maximum pulse value, minimum pulse value, maximum pulse repetition value, and minimum pulse repetition value, such that the maximum pulse value and the minimum pulse value sum to n; the maximum pulse value represents a number of pulses to provide in the maximum pulse repetition value of n sub-periods; and the minimum pulse value represents a number of pulses to provide in the minimum pulse repetition value of n sub-periods.

11. The method of claim 10 further comprising generating a pulse map corresponding to the fractional pulse rate to assign either the maximum pulse value or the minimum pulse value of pulses to each of the n sub-periods based on the minimum pulse repetition value and the maximum pulse repetition value.

12. The method of claim 10 wherein the maximum pulse repetition value of sub-periods at a beginning of the period are provided the maximum pulse value of pulses.

13. The method of claim 10 wherein the minimum pulse repetition value of sub-periods at a beginning of the period are provided the minimum pulse value of pulses.

14. The method of claim 10 wherein the maximum pulse value of pulses and the minimum pulse value of pulses are interleaved throughout the sub-periods during the period.

15. The method of claim 10 wherein when the fractional pulse rate is x.y, such that x is an integer; $0 < y < 10$; the maximum pulse value is x +1; the minimum pulse value is x; and the maximum pulse repetition value and the minimum pulse repetition value sum to n.

16. The method of claim 10 wherein the sub-period is a charge interval.

17. The method of claim 1 wherein the call tariff model defines charge intervals and a phase that is not evenly divisible by the charge intervals, such that the phase ends with a partial charge interval, the method further comprising providing a number of pulses during the partial charge interval equal to a number of pulses provided during a charge interval.

18. The method of claim 1 wherein the call tariff model defines charge intervals and a phase that is not evenly divisible by the charge intervals, such that the phase ends with a partial charge interval, the method further comprising providing a number of pulses during the partial charge interval to approximate a tariff pulse rate for the phase.

19. The method of claim 1 wherein parameter values for a given parameter for each phase of the call tariff model are provided with a single parameter identity in the message.

20. The method of claim 1 wherein the message is received from a media gateway controller over the packet network and the pulses are provided over a telephony circuit to either a telephony endpoint having a metering function or to a metering device associated with the telephony endpoint.

21. A system for providing metering from a gateway in a packet network comprising:
    a) a packet interface to facilitate communication over a packet network;
    b) a telephony line interface to facilitate communications over a telephony line to either a telephony endpoint having a metering function or a metering device associated with the telephony endpoint; and
    c) a control system associated with the packet interface and the telephony line interface and adapted to:
        i) receive a message over the packet network comprising a complete call tariff model for controlling all metering in association with a call; and
        ii) provide pulses via the telephony line interface during the call according to the call tariff model.

22. The system of claim 21 wherein the call tariff model defines a plurality of phases for the call, such that each phase is associated with a different tariff rate.

23. The system of claim 22 wherein each phase is associated with tariff parameters and a phase duration.

24. The system of claim 21 wherein the call tariff model defines a number of one-time charge pulses to provide during the call for a one-time charge.

25. The system of claim 24 wherein the one-time charge is a set-up charge.

26. The system of claim 24 wherein the one-time charge is an add-on charge.

27. The system of claim 24 wherein to provide the pulses, the control system is further adapted to provide the one-time charge pulses; provide recovery pulses to compensate for normal tariff pulses that should have been provided when the one-time charge pulses are provided; and provide normal tariff pulses after the one-time charge pulses and the recovery pulses are provided.

28. The system of claim 24 wherein the call tariff model divides a phase of the call into a plurality of pulse windows, such that a first pulse window defines the number of pulses for the one-time charge and normal tariff pulses for a first portion of the phase, and a second pulse window defines the normal tariff pulses for a second portion of the phase.

29. The system of claim 28 wherein the call includes other pulse windows, which correspond to other phases.

30. The system of claim 21 wherein the call tariff model defines a fractional pulse rate to implement over a given period, which is divided into n sub-periods, by providing a maximum pulse value, minimum pulse value, maximum pulse repetition value, and minimum pulse repetition value, such that the maximum pulse value and the minimum pulse value sum to n; the maximum pulse value represents a number of pulses to provide in the maximum pulse repetition value of n sub-periods; the minimum pulse value represents a number of pulses to provide in the minimum pulse repetition value of n sub-periods.

31. The system of claim 30 wherein the control system is further adapted to generate a pulse map corresponding to the fractional pulse rate to assign either the maximum pulse value or the minimum pulse value of pulses to each of the n sub-periods based on the minimum pulse repetition value and the maximum pulse repetition value.

32. The system of claim 30 wherein the maximum pulse repetition value of sub-periods at a beginning of the period are provided the maximum pulse value of pulses.

33. The system of claim 30 wherein the minimum pulse repetition value of sub-periods at a beginning of the period are provided the minimum pulse value of pulses.

34. The system of claim 30 wherein the maximum pulse value of pulses and the minimum pulse value of pulses are interleaved throughout the sub-periods during the period.

35. The system of claim 30 wherein when the fractional pulse rate is x.y, such that x is an integer; $0 < y < 10$; the maximum pulse value is x +1; the minimum pulse value is x; and the maximum pulse repetition value and the minimum pulse repetition value sum to n.

36. The system of claim 30 wherein the sub-period is a charge interval.

37. The system of claim 21 wherein the call tariff model defines charge intervals and a phase that is not evenly divisible by the charge intervals, such that the phase ends with a partial charge interval, wherein the control system is further adapted to provide a number of pulses during the partial charge interval equal to a number of pulses provided during a charge interval.

38. The system of claim 21 wherein the call tariff model defines charge intervals and a phase that is not evenly divisible by the charge intervals, such that the phase ends with a partial charge interval, wherein the control system is further adapted to provide a number of pulses during the partial charge interval to approximate a tariff pulse rate for the phase.

39. The system of claim 21 wherein parameter values for a given parameter for each phase of the call tariff model are provided with a single parameter identity in the message.

40. A method for providing metering from a gateway in a packet network comprising:
    a) generating a message comprising a complete call tariff model for controlling all metering in association with a call; and
    b) sending the message over a packet network to a media gateway supporting the call.

41. A system for providing metering from a gateway in a packet network comprising:
    a) a packet interface to facilitate communication with a media gateway over a packet network; and
    b) a control system associated with the packet interface and adapted to:
        i) generate a message comprising a complete call tariff model for controlling all metering in association with a call; and
        ii) send the message over the packet network to the media gateway supporting the call.